IHO ENC WG

The need (and options) for better ENC bathymetry

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MAIB/DMAIB Report on the Application and Usability of ECDIS

- The report's conclusion included:
  - *From a user perspective, ECDIS does contribute to safe navigation, but the challenges that have accompanied its introduction are problematic. Some of these challenges stem from the system s automation not always working efficiently due either to the lack of bathymetric fidelity i.e the provision of depth contours in the same manner as provided on paper charts and/or human-centred design not being considered.*

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CHALLENGES

- The distraction of alerts and alarms at sea (including safety contour)
  - *”alarms can be a good thing, but 99% of them are simply useless or false.”*
- The frequent impracticality of setting a safety contour that separates safe from unsafe water
  - *“We need more contours, so we can fit in all kinds of drafts for all sizes of ships.”*
- The difficulty of residual manual tasks such as text notes/radar Pis/limiting danger lines (user-drawn contours)

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BEHAVIOURS

Challenges with ECDIS use has led to common behaviours:

- Alarm normalisation or disablement
- Workarounds for the safety contour (official/unofficial)
  - *”C/O, cruise ship: I am always working outside of what it defines as the safe waters, especially in tidal ports, this could be more reliable. I would like to be able to set it. You adjust the system, so it looks as if you can enter the port.”*
- Residual manual tasks not completed (limiting danger lines/user-drawn contours)

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OVERCOMING CHALLENGES

- The study identified two pathways for future improvements to ENC bathymetric data that would improve ECDIS usability/overcome challenges:
  - **1. Increasing the availability of high density ENCs:**
    - *"achievable goals for improving the utility of ENCs could include the provision of high density charts for areas in which the standard of survey data already exists."*
  - **2. Introducing high definition bathymetry (S102):**
    - *"The benefits of the use of high-definition bathymetry data would bring to ECDIS performance can only be realised if the IMO, the IHO, and ECDIS manufacturers work together to facilitate the accurate and automatic separation of safe from unsafe water in ECDIS, balancing the benefits of high-definition bathymetry against the drawbacks of enormous data sets."*

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HIGH DENSITY v HIGH DEFINITION

- Availability of both limited by survey quality (derived from the same survey data)
- High Density ENCs potentially more achievable in the short term (S57 - minimum disruption)
- Impact on other challenges/factors identified during the study:
  - Training (still significant focus on paper chart practices)
  - Familiarisation
  - The logistics of software upgrades – lessons from V4.0 (user/ship owner/manufacturer/flag state perspectives)
  - Size of datasets (hardware requirements/system speed/chart supply and update)
  - Human-centred approach/user feedback

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